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Dykstra

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(54) **PRIMER INSTALLATION DEVICE**

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(52) **U.S. Cl.**
CPC ***F42B 33/04*** (2013.01); ***F42B 33/001*** (2013.01); ***F42B 33/004*** (2013.01)

(58) **Field of Classification Search**
CPC F42B 33/001; F42B 33/004; F42B 33/04; F42B 5/36
USPC 86/19.8, 32, 36
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

774,827	A *	11/1904	Butler	86/36
887,508	A *	5/1908	Olin	86/32
1,502,824	A	7/1924	Louis	
2,061,977	A	11/1936	Newcomb	
2,775,157	A	12/1956	Hunt, Jr.	
2,800,830	A *	7/1957	Gerstenberger	86/23
2,807,186	A	9/1957	Veum	
3,060,788	A *	10/1962	Blesi et al.	86/27
3,128,668	A *	4/1964	Dicken	86/45
3,152,508	A *	10/1964	Fratila	86/38
3,157,086	A *	11/1964	Bachhuber	86/27
3,205,762	A *	9/1965	Parke	86/36
3,259,007	A *	7/1966	Havourd et al.	86/36
3,320,848	A *	5/1967	Ponsness	86/38
3,349,663	A	10/1967	Slee	
3,555,959	A *	1/1971	Lee	86/37
3,636,812	A	1/1972	Nuler	
4,031,804	A *	6/1977	Boschi	86/23
4,222,305	A *	9/1980	Lee	86/37
4,228,724	A	10/1980	Leich	
4,331,063	A	5/1982	Schaenzer	
4,332,185	A	6/1982	Hargrove	
4,375,778	A *	3/1983	Ryan	86/36
4,393,744	A *	7/1983	Lee	86/25
4,429,610	A *	2/1984	Mantel	86/36
4,522,102	A *	6/1985	Pickens	86/27
4,542,677	A *	9/1985	Lee	86/38
4,590,841	A *	5/1986	Davis	86/36
4,615,255	A *	10/1986	Carter	86/27
5,025,706	A *	6/1991	Markle	86/37
5,198,606	A *	3/1993	Storstad et al.	86/32
5,435,223	A *	7/1995	Blodgett et al.	86/38
5,693,905	A	12/1997	Blodgett	
6,260,463	B1	7/2001	Brand	
7,806,034	B1	10/2010	Lee	

* cited by examiner

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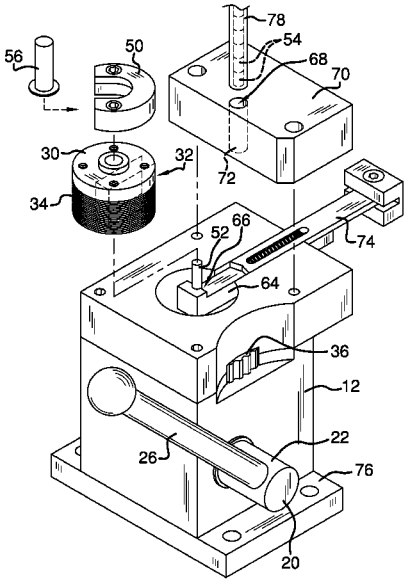
(57) **ABSTRACT**

A primer installation device provides consistent placement of a primer in an ammunition shell. The device includes a ram rod coupled to and positioned in a housing. An elevator is coupled to the housing. A position of the elevator is adjustable relative to the housing. The elevator is structured to comprise a conduit. A shell holder is coupled to the elevator. A loading pin is operationally coupled to the ram rod wherein operation of the ram rod extends the loading pin through the conduit in the elevator and through the shell holder such that the loading pin is configured for installing a primer into a shell positioned in the shell holder. Full extension of the loading pin is determined by physical obstruction of operation of the ram rod.

16 Claims, 7 Drawing Sheets



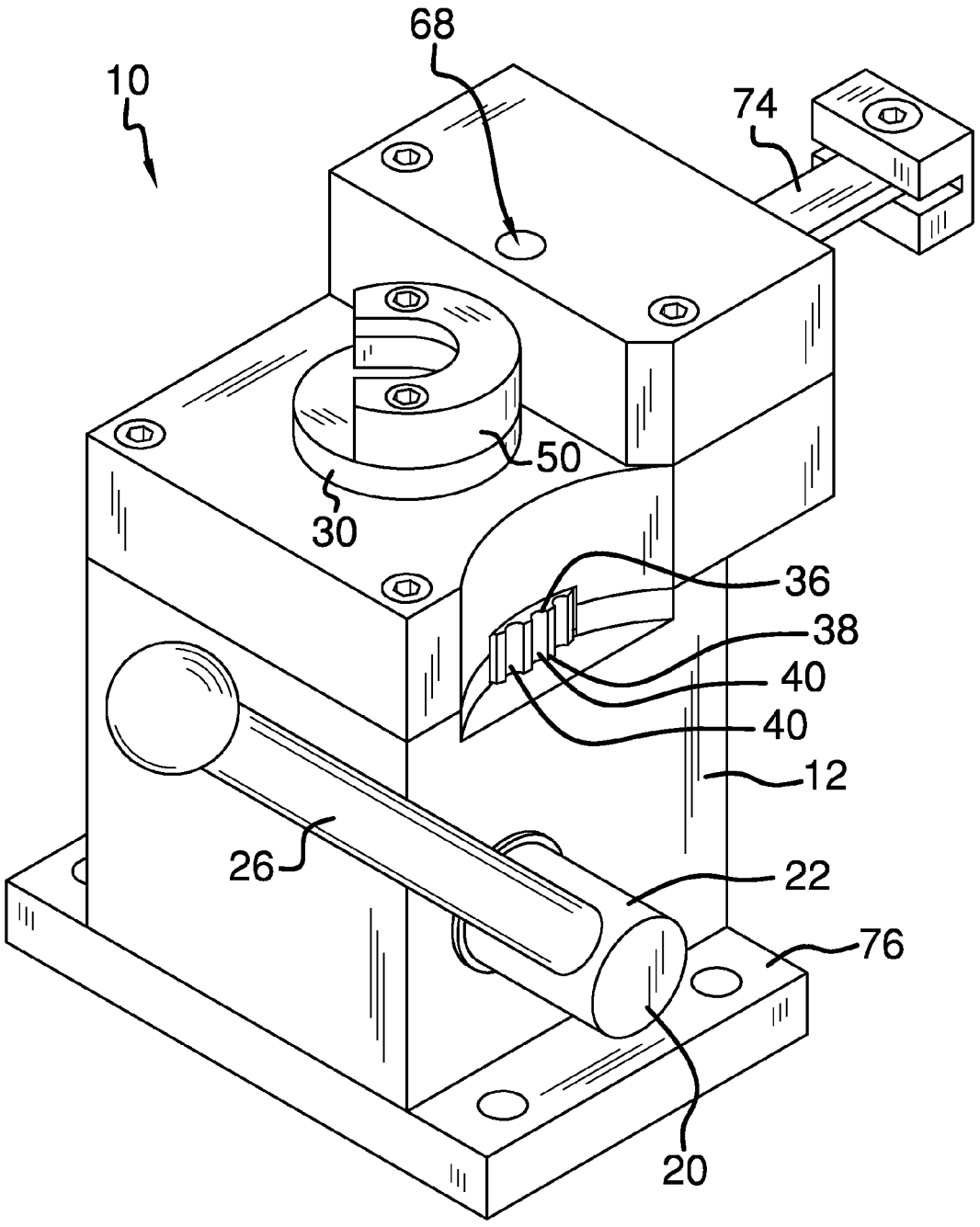


FIG. 1

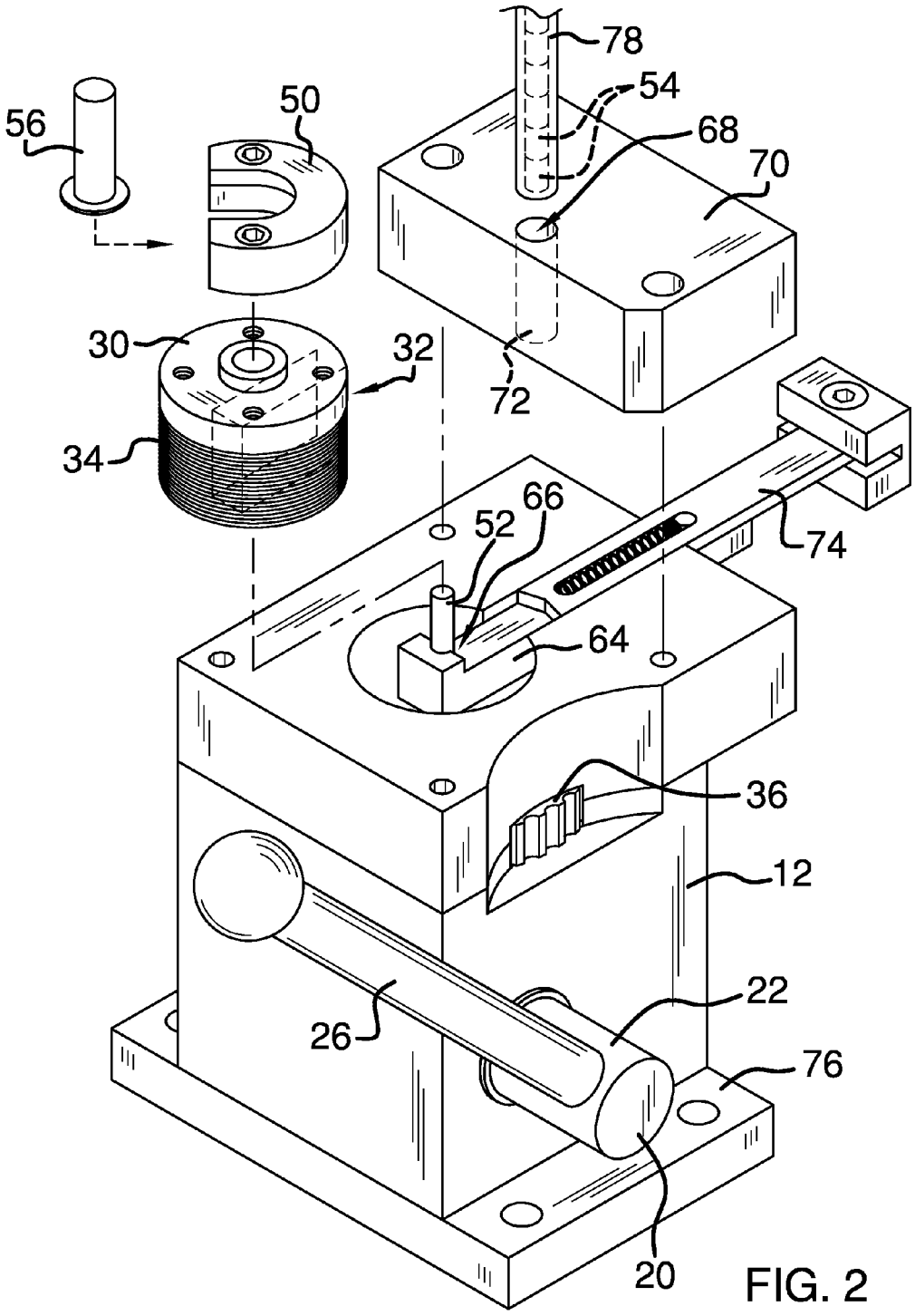


FIG. 2

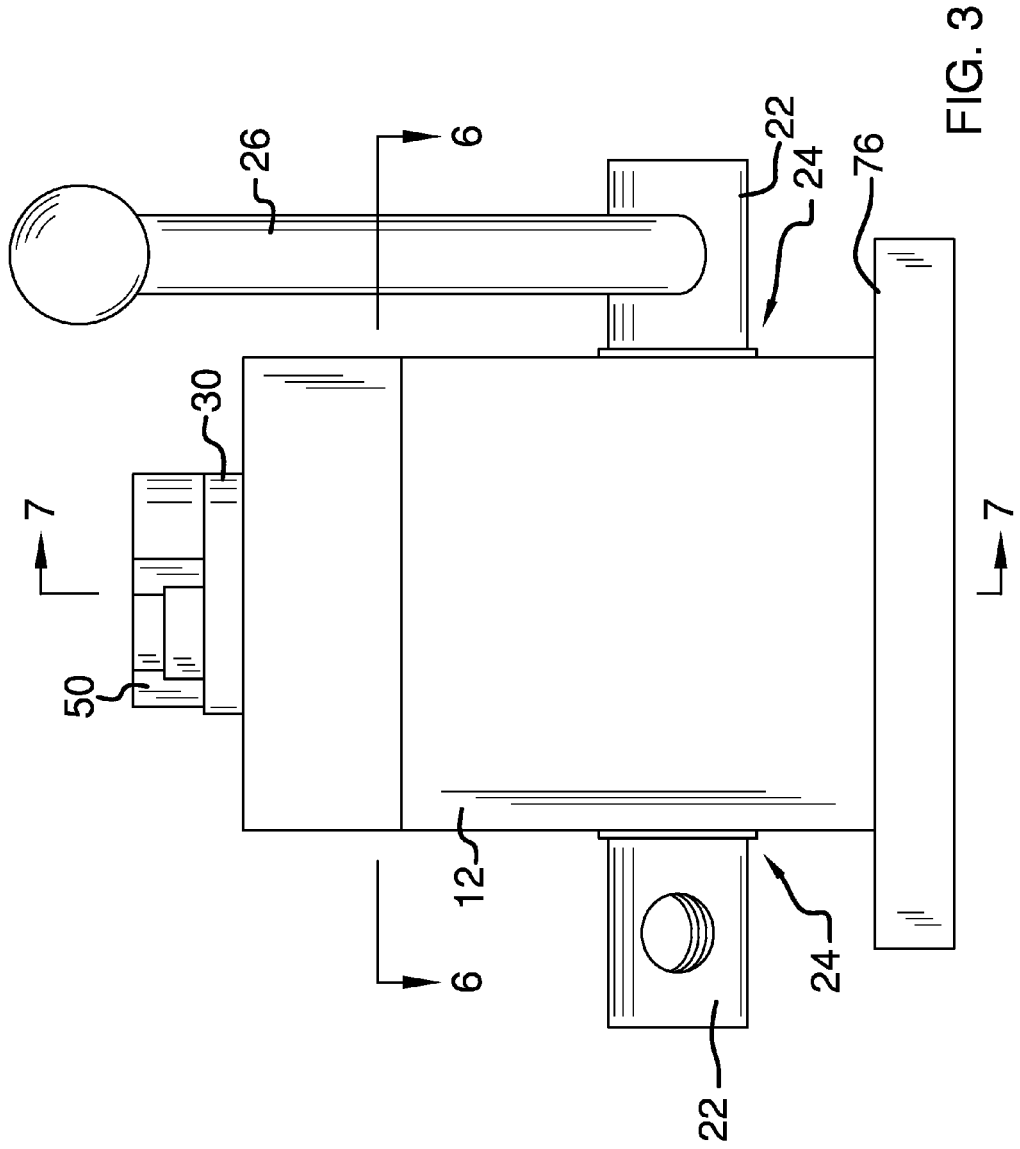


FIG. 3

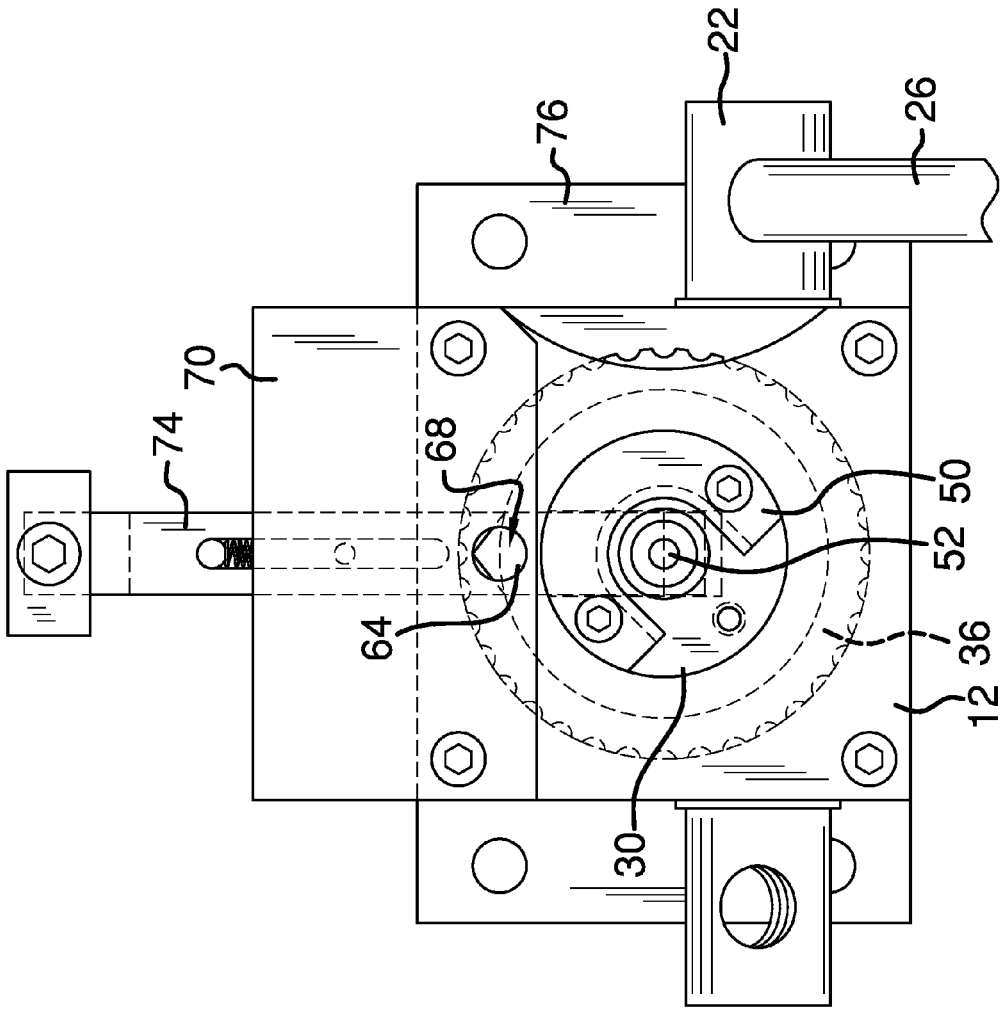


FIG. 4

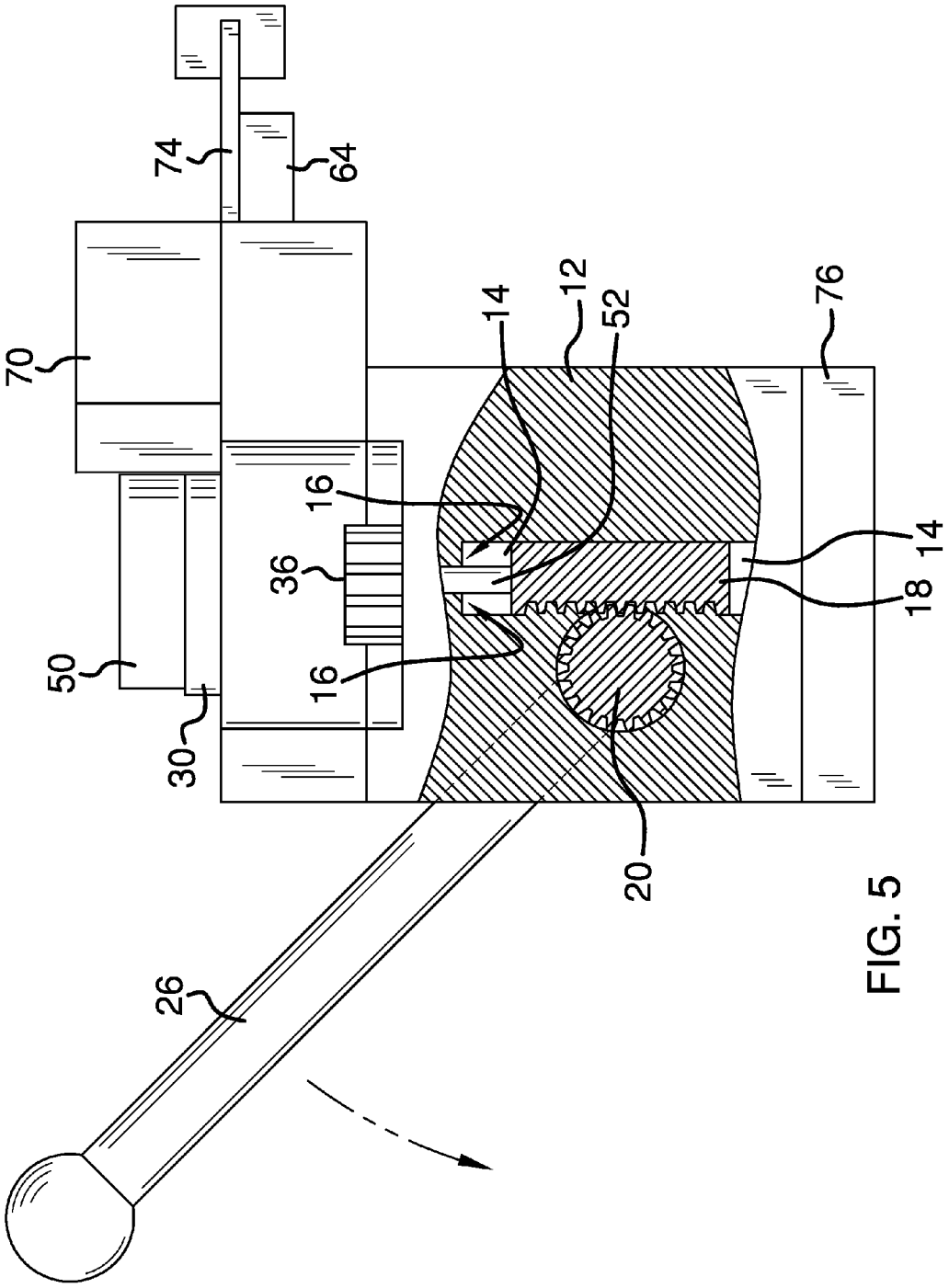


FIG. 5

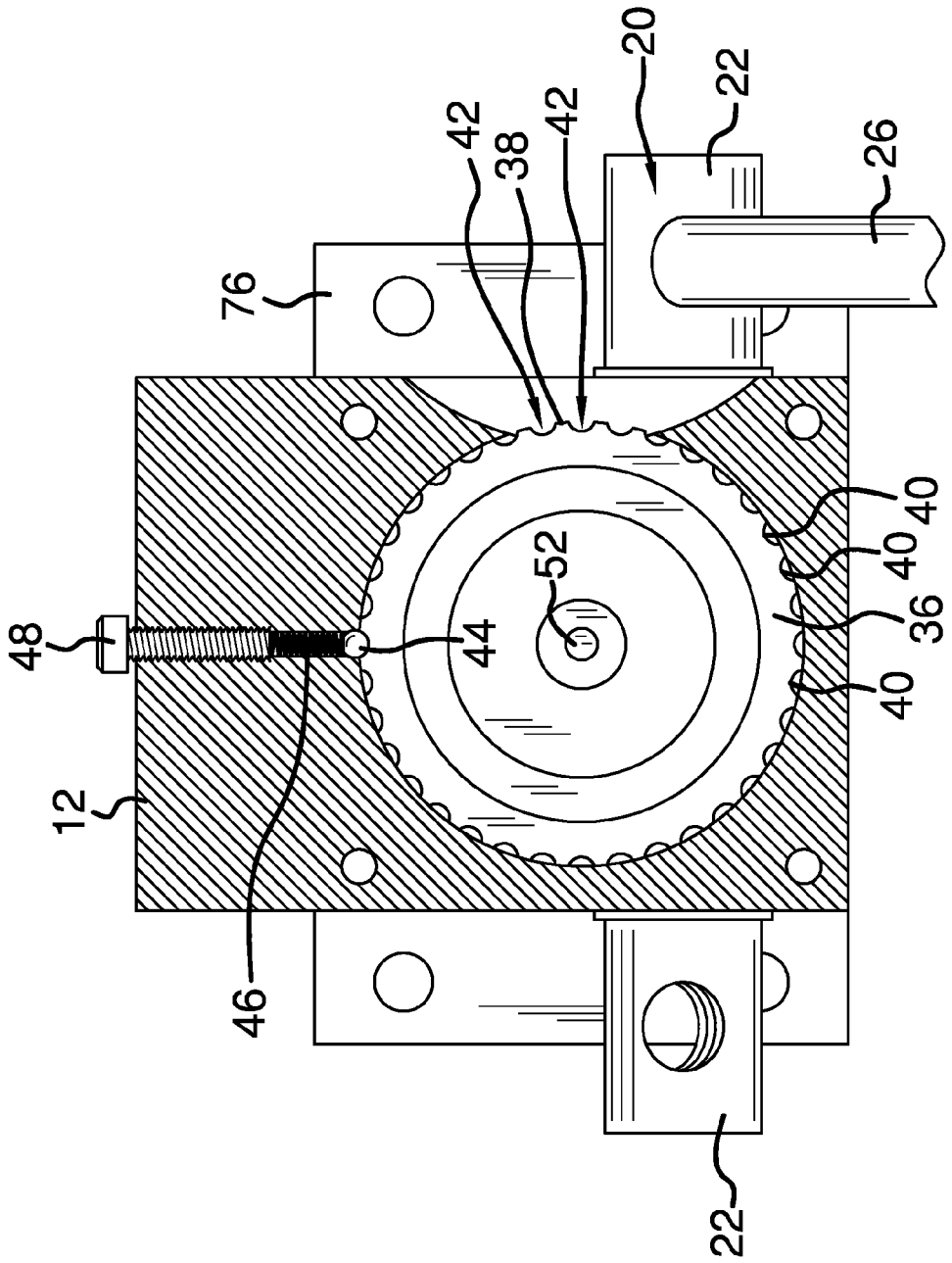


FIG. 6

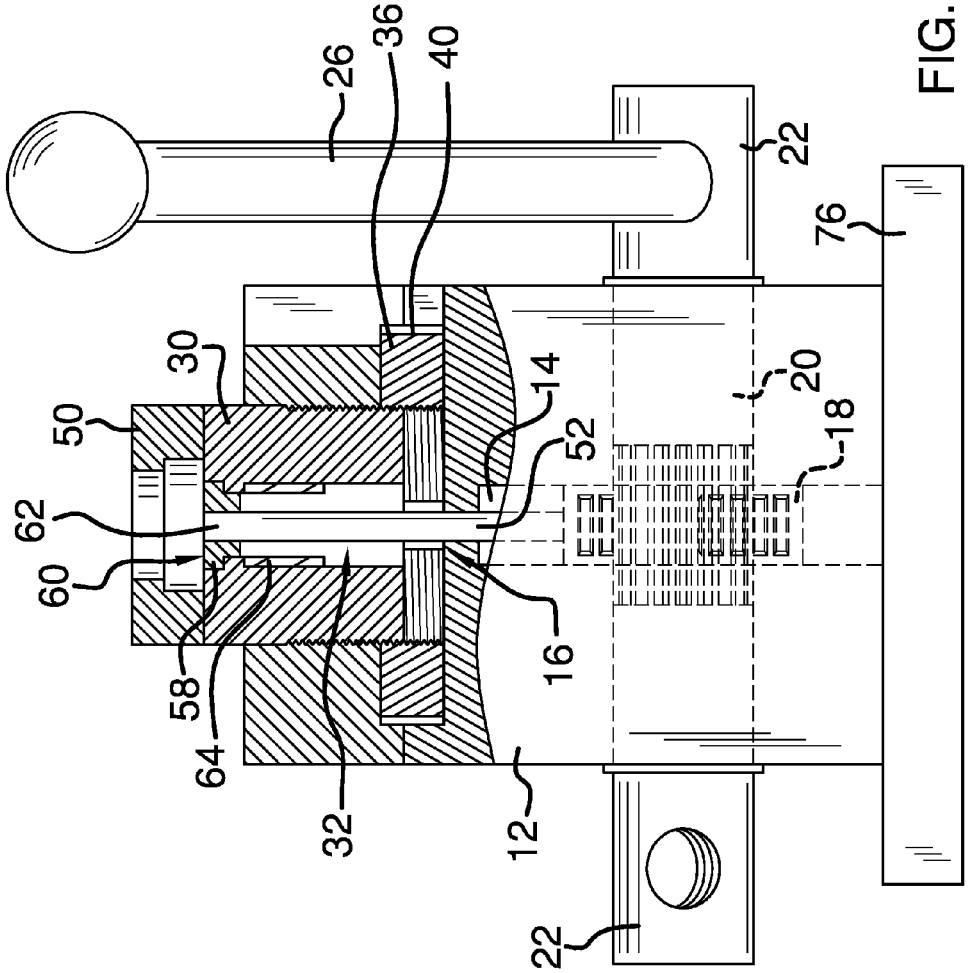


FIG. 7

PRIMER INSTALLATION DEVICE

BACKGROUND OF THE DISCLOSURE

Field of the Disclosure

The disclosure relates to primer installation devices and more particularly pertains to a new primer installation device for providing consistent placement of a primer in an ammunition shell allowing a user to efficiently reload shells with each shell having a selectable, precise, and consistent primer position to enhance shooting precision.

SUMMARY OF THE DISCLOSURE

An embodiment of the disclosure meets the needs presented above by generally comprising a ram rod coupled to and positioned in a housing. An elevator is coupled to the housing. A position of the elevator is adjustable relative to the housing. The elevator is structured to comprise a conduit. A shell holder is coupled to the elevator. A loading pin is operationally coupled to the ram rod wherein operation of the ram rod extends the loading pin through the conduit in the elevator and through the shell holder such that the loading pin is configured for installing a primer into a shell positioned in the shell holder. Full extension of the loading pin is determined by physical obstruction of operation of the ram rod.

There has thus been outlined, rather broadly, the more important features of the disclosure in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are additional features of the disclosure that will be described hereinafter and which will form the subject matter of the claims appended hereto.

The objects of the disclosure, along with the various features of novelty which characterize the disclosure, are pointed out with particularity in the claims annexed to and forming a part of this disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosure will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

FIG. **1** is a top front side perspective view of a primer installation device according to an embodiment of the disclosure.

FIG. **2** is a partially exploded top front side perspective view of an embodiment of the disclosure.

FIG. **3** is a front view of an embodiment of the disclosure.

FIG. **4** is a top view of an embodiment of the disclosure.

FIG. **5** is a partial cut away side view of an embodiment of the disclosure.

FIG. **6** is a cross-sectional view of an embodiment of the disclosure taken along line **6-6** of FIG. **3**.

FIG. **7** is a partial cut-away front view of an embodiment of the disclosure.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference now to the drawings, and in particular to FIGS. **1** through **7** thereof, a new primer installation device

embodying the principles and concepts of an embodiment of the disclosure and generally designated by the reference numeral **10** will be described.

As best illustrated in FIGS. **1** through **7**, the primer installation device **10** generally comprises a housing **12** defining a ram chamber **14** having an upper lip **16**. A ram rod **18** is coupled to the housing **12** by being positioned in the ram chamber **14**. The ram rod **18** abuts the upper lip **16** when the ram rod **18** is fully elevated within the ram chamber **14**. A ram rotor **20** is coupled to the housing **12**. The ram rotor **20** engages the ram rod **18** defining a rack and pinion mechanism such that rotation of the ram rotor **20** elevates the ram rod **18** within the ram chamber **14**. The housing **12** may be attached to a base plate **76** configured for coupling to a support structure.

The ram rotor **20** has a pair of end sections **22**. Each of the end sections **22** of the ram rotor **20** extends from a respective side **24** of the housing **12**. A handle **26** is coupled to the ram rotor **20** such that manipulation of the handle **26** rotates the ram rotor **20**. The handle **26** is removably coupled to a selectable one of the end sections **22** of the ram rotor **20** allowing the handle **26** to be positioned on either side **24** of the housing **12** to accommodate use of the handle **26** by the right hand or left hand of a user. The handle **26** is attached to the ram rotor **20** using threading or another conventional removable connection.

An elevator **30** is coupled to the housing **12** in vertical alignment with the ram chamber **14**. A position of the elevator **30** is adjustable relative to the housing **12** as described in more detail below. A slot **32** extends into the elevator **30**. The elevator **30** has a threaded portion **34**. A wheel **36** has a threaded surface **38** complementary to and engaging the threaded portion **34** of the elevator **30**. The wheel **36** is coupled to the housing **12** such that the wheel **36** is rotatable within a fixed position in the housing **12**. The slot **32** in the elevator **30** is generally engaged to prevent rotation of the elevator **30** within the housing **12**. Thus, rotation of the wheel **36** moves the elevator up and down in the housing **12** and adjusts a position of the elevator **30** relative to the upper lip **16**.

An outer surface **38** of the wheel **36** is structured to comprise a plurality of detents **40**. The detents **40** are evenly spaced around the outer surface **38** of the wheel **36** wherein the detents **40** define a plurality of incremental stops **42** around the wheel **36**. Spacing of the detents **40** is correlated to correspond to the threaded portion **34** of the elevator **30** such that rotation of the wheel **36** between adjacent stops **42** moves the elevator **30** a distance between 0.5 and 2.0 thousandths of a inch relative to the upper lip **16**. A ball bearing **44** is positioned in the housing **12** and positioned to engage each detent **40** as the wheel **36** is rotated such that engagement of the ball bearing **44** to each detent **40** provides resistance to rotation of the wheel **36**. A biasing member **46** is coupled to the housing **12** urging the ball bearing **44** into contact with the outer surface **38** of the wheel **36**. A screw **48** is coupled to the housing **12**. The biasing member **46** is positioned between the screw **48** and the ball bearing **44** such that manipulation of the screw **48** selectively compresses and decompresses the biasing member **46** between the ball bearing **44** and the screw **48**. Thus, pressure exerted on the wheel **36** by the ball bearing **44** is adjustable by manipulation of the screw **48**. Sufficient tightening of the screw **48** provides for resistance to prevent rotation of the wheel **36** relative to the housing **12**, fixing the position of the elevator **30** relative to the upper lip **16**.

A shell holder **50** of conventional design is coupled to the elevator **30** such that the shell holder **50** is held in a fixed position relative to the elevator **30** as the ram rod **18** is actu-

ated. A loading pin **52** rests on the ram rod **18** such that the loading pin **52** is operationally coupled to the ram rod **18**. Operation of the ram rod **18** extends the loading pin **52** through the elevator **30** and the shell holder **50** such that the loading pin **52** is configured for installing a primer **54** into a shell **56** positioned in the shell holder **50**. Full extension of the loading pin **52** is determined by physical obstruction of operation of the ram rod **18** within the ram chamber **14** providing precise repeatable positioning of the loading pin **52**, and thus the primer **54**, relative to the shell **56** in the shell holder **50**. A bushing **58** is positioned in a conduit **60** extending through the elevator **30**. The loading pin **52** extends through the conduit **60** such that the bushing **58** centers the loading pin **52** within the conduit **60**.

The loading pin **52** may be one of a plurality of loading pins **52** with each loading pin **52** having a unique diameter transverse to a longitudinal axis of the loading pin **52** corresponding to loading of primers **54** corresponding to various sizes of shells **56**. The bushing **58** is one of a plurality of bushings **58**. A size of a central opening **62** of each bushing **58** corresponds to a respective one of the loading pins **52**.

A shuttle bed **64** is coupled to and extends through the housing **12**. The shuttle bed **64** defines a seat **66** aligned with the loading pin **52**. The seat **66** is configured for receiving the primer **54** such that the primer **54** is aligned with the loading pin **52**. The loading pin **52** is extended through the shuttle bed **64** when the ram rod **18** is extended. Thus, the loading pin **52** is configured to urge the primer **54** positioned in the seat **66** into the shell **56** positioned in the shell holder **50**. The shuttle bed **64** extends through the housing **12** and into the slot **32** in the elevator **30** wherein the shuttle bed **64** prevents rotation of the elevator **30** within the housing **12**. The shuttle bed **64** may also be one of a plurality of shuttle beds **64** interchangeably couplable to the housing **12** with each shuttle bed **64** being configured to correspond to a respective one of the loading pins **52** for a particular size of shell **56**. A chute **68** is coupled to the housing **12**. The chute **68** may be incorporated into a block **70** coupled to the housing **12**. The chute **68** has a dispensing opening **72** aligned with the shuttle bed **64** wherein the chute **68** is configured for delivering the primer **54** to the shuttle bed **64** spaced from the seat **66**. A slide **74** is coupled to the shuttle bed **64**. The slide **74** is movable along the shuttle bed **64** such that the slide **74** is configured to move the primer **54** along the shuttle bed **64** to the seat **66**. The slide **74** may be biased such that the slide **74** is urged away from the seat **66** until manipulated. The chute **68** is transversely oriented relative to the shuttle bed **64** wherein the chute **68** is configured to receive a tube **78** of vertically stacked primers **54** such that the primers **54** are sequentially dispensed onto the shuttle bed **64** with each manipulation of the slide **74**.

In use, the device **10** is assembled using the desired size of loading pin **52**, shuttle bed **64**, bushing **58**, shell holder **50**, and other components which may correspond to a particular size of ammunition. The wheel **36** is rotated to a desired position corresponding to a precise positioning of the shell holder **50** relative to the upper lip **16** within the housing **12**. A shell **56** is engaged to the shell holder **50** and a primer **54** is positioned in the seat **66** by manipulation of the slide **74**. The handle **26** is manipulated to move the ram rod **18** until the ram rod **18** abuts the upper lip **16**. The primer **54** is driven into the shell **56** until the ram rod **18** against the upper lip **16**. The shell **56** is now primed and removed from the shell holder **50**. A new shell **56** is loaded and the process repeated with each primer **54** being driven to a precise, adjustable, consistent position in the respective shell **56**.

With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of an embodiment enabled by the disclosure, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by an embodiment of the disclosure.

Therefore, the foregoing is considered as illustrative only of the principles of the disclosure. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the disclosure to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the disclosure. In this patent document, the word "comprising" is used in its non-limiting sense to mean that items following the word are included, but items not specifically mentioned are not excluded. A reference to an element by the indefinite article "a" does not exclude the possibility that more than one of the element is present, unless the context clearly requires that there be only one of the elements.

I claim:

1. A primer installation device comprising:

a housing, said housing defining a ram chamber having an upper lip;

a ram rod coupled to and positioned in said housing, said ram rod abutting said upper lip when said ram rod is fully elevated within said ram chamber;

an elevator coupled to said housing, said elevator having a threaded portion, a position of said elevator being adjustable relative to said housing, said elevator being structured to comprise a conduit;

a wheel having a threaded surface, said threaded surface being complementary to and engaging said threaded portion of said elevator, said wheel being coupled to said housing such that said wheel is rotatable within a fixed position in said housing whereby rotation of said wheel adjusts a position of said elevator relative to said upper lip;

a shell holder coupled to said elevator;

a loading pin operationally coupled to said ram rod wherein operation of said ram rod extends said loading pin through said conduit in said elevator and through said shell holder such that said loading pin is configured for installing a primer into a shell positioned in said shell holder; and

wherein full extension of said loading pin is determined by physical obstruction of operation of said ram rod.

2. The device of claim **1**, further comprising a ram rotor coupled to said housing, said ram rotor engaging said ram rod such that rotation of said ram rotor elevates said ram rod within said ram chamber.

3. The device of claim **2**, further comprising a handle coupled to said ram rotor such that manipulation of said handle rotates said ram rotor.

4. The device of claim **3**, further comprising said ram rotor having a pair of end sections, each of said end sections of said ram rotor extending from a respective side of said housing, said handle being removably coupled to a selectable one of said end sections of said ram rotor.

5. The device of claim **1**, further comprising:

an outer surface of said wheel being structured to comprise a plurality of detents; and

a ball bearing positioned in said housing, said ball bearing being positioned to engage each said detent as said

wheel is rotated such that engagement of said ball bearing to each said detent provides resistance to rotation of said wheel.

6. The device of claim **5**, further comprising:

a biasing member coupled to said housing, said biasing member urging said ball bearing into contact with said outer surface of said wheel; and

a screw coupled to said housing, said biasing member being positioned between said screw and said ball bearing such that manipulation of said screw selectively compresses and decompresses said biasing member between said ball bearing and said screw wherein pressure exerted on said wheel by said ball bearing is adjustable by manipulation of said screw.

7. The device of claim **5**, further comprising said detents being evenly spaced around said outer surface of said wheel wherein said detents define a plurality of incremental stops around said wheel.

8. The device of claim **7**, further comprising spacing of said detents corresponding to said threaded portion of said elevator such that rotation of said wheel between adjacent stops moves said elevator a distance between 0.5 and 2.0 thousandths of a inch relative to said upper lip.

9. The device of claim **1**, further comprising

a bushing positioned in said conduit, said loading pin extending through said conduit such that said bushing centers said loading pin within said conduit.

10. The device of claim **9**, further comprising:

said loading pin being one of a plurality of loading pins, each said loading pin having a unique diameter transverse to a longitudinal axis of said loading pin; and

said bushing being one of a plurality of bushings, a size of a central opening of each said bushing corresponding to a respective one of said loading pins.

11. The device of claim **1**, further comprising a shuttle bed coupled to and extending through said housing, said shuttle bed defining a seat aligned with said loading pin, said seat being configured for receiving the primer such that the primer is aligned with said loading pin, said loading pin being extended through said shuttle bed when said ram rod is extended wherein said loading pin is configured to urge the primer into the shell positioned in said shell holder.

12. The device of claim **1**, further comprising:

a ram rotor coupled to said housing, said ram rotor engaging said ram rod such that rotation of said ram rotor elevates said ram rod within said ram chamber, said ram rotor having a pair of end sections, each of said end sections of said ram rotor extending from a respective side of said housing;

a handle coupled to said ram rotor such that manipulation of said handle rotates said ram rotor, said handle being removably coupled to a selectable one of said end sections of said ram rotor;

an outer surface of said wheel being structured to comprise a plurality of detents, said detents being evenly spaced around said outer surface of said wheel wherein said detents define a plurality of incremental stops around said wheel, spacing of said detents corresponding to said threaded portion of said elevator such that rotation of said wheel between adjacent stops moves said elevator a distance between 0.5 and 2.0 thousandths of a inch relative to said upper lip;

a ball bearing positioned in said housing, said ball bearing being positioned to engage each said detent as said wheel is rotated such that engagement of said ball bearing to each said detent provides resistance to rotation of said wheel;

a biasing member coupled to said housing, said biasing member urging said ball bearing into contact with said outer surface of said wheel;

a screw coupled to said housing, said biasing member being positioned between said screw and said ball bearing such that manipulation of said screw selectively compresses and decompresses said biasing member between said ball bearing and said screw wherein pressure exerted on said wheel by said ball bearing is adjustable by manipulation of said screw;

said loading pin being one of a plurality of loading pins, each said loading pin having a unique diameter transverse to a longitudinal axis of said loading pin;

a bushing positioned in said conduit, said loading pin extending through said conduit such that said bushing centers said loading pin within said conduit, said bushing being one of a plurality of bushings, a size of a central opening of each said bushing corresponding to a respective one of said loading pins;

a shuttle bed coupled to and extending through said housing, said shuttle bed defining a seat aligned with said loading pin, said seat being configured for receiving the primer such that the primer is aligned with said loading pin, said loading pin being extended through said shuttle bed when said ram rod is extended wherein said loading pin is configured to urge the primer into the shell positioned in said shell holder, said shuttle bed extending through said housing and into said slot in said elevator wherein said shuttle bed prevents rotation of said elevator within said housing, said shuttle bed being one of a plurality of shuttle beds interchangeably couplable to said housing, each said shuttle bed being configured to correspond to a respective one of said loading pins;

a chute coupled to said housing, said chute having a dispensing opening aligned with said shuttle bed wherein said chute is configured for delivering a primer to said shuttle bed; and

a slide coupled to said shuttle bed, said slide being movable along said shuttle bed such that said slide is configured to move the primer along said shuttle bed to said seat, said slide being biased such that said slide is urged away from said seat until manipulated, said chute being transversely oriented relative to said shuttle bed wherein said chute is configured to receive a tube of vertically stacked primers such that the primers are sequentially dispensed onto said shuttle bed upon manipulation of said slide.

13. A primer installation device comprising:

a housing;

a ram rod coupled to and positioned in said housing;

an elevator coupled to said housing, a position of said elevator being adjustable relative to said housing, said elevator being structured to comprise a conduit;

a shell holder coupled to said elevator;

a loading pin operationally coupled to said ram rod wherein operation of said ram rod extends said loading pin through said conduit in said elevator and through said shell holder such that said loading pin is configured for installing a primer into a shell positioned in said shell holder;

wherein full extension of said loading pin is determined by physical obstruction of operation of said ram rod;

a shuttle bed coupled to and extending through said housing, said shuttle bed defining a seat aligned with said loading pin, said seat being configured for receiving the primer such that the primer is aligned with said loading pin, said loading pin being extended through said shuttle

bed when said ram rod is extended wherein said loading pin is configured to urge the primer into the shell positioned in said shell holder;

a slot extending into said elevator; and

said shuttle bed extending through said housing and into said slot in said elevator wherein said shuttle bed prevents rotation of said elevator within said housing.

14. A primer installation device comprising:

a housing;

a ram rod coupled to and positioned in said housing;

an elevator coupled to said housing, a position of said elevator being adjustable relative to said housing, said elevator being structured to comprise a conduit;

a shell holder coupled to said elevator;

a loading pin operationally coupled to said ram rod wherein operation of said ram rod extends said loading pin through said conduit in said elevator and through said shell holder such that said loading pin is configured for installing a primer into a shell positioned in said shell holder;

wherein full extension of said loading pin is determined by physical obstruction of operation of said ram rod;

a shuttle bed coupled to and extending through said housing, said shuttle bed defining a seat aligned with said loading pin, said seat being configured for receiving the primer such that the primer is aligned with said loading pin, said loading pin being extended through said shuttle bed when said ram rod is extended wherein said loading pin is configured to urge the primer into the shell positioned in said shell holder;

a chute coupled to said housing, said chute having a dispensing opening aligned with said shuttle bed wherein said chute is configured for delivering a primer to said shuttle bed; and

a slide coupled to said shuttle bed, said slide being movable along said shuttle bed such that said slide is configured to move the primer along said shuttle bed to said seat.

15. The device of claim **14**, further comprising said slide being biased such that said slide is urged away from said seat until manipulated.

16. The device of claim **14**, further comprising said chute being transversely oriented relative to said shuttle bed wherein said chute is configured to receive a tube of vertically stacked primers such that the primers are sequentially dispensed onto said shuttle bed upon manipulation of said slide.

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